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Description

[RESTAURANT WITH DECENTRALIZED COOKING SYSTEM]

Background of Invention

[0001] This invention generally relates to restaurants. More specifically, this invention relates to restaurants with decentralized cooking systems, such that diners are provided with options to select and cook foods by themselves, whereby each dish is individually cooked and customized to diners' preference.

[0002] Conventional restaurants have centralized kitchens. Dishes are prepared in a remote kitchen in batches and then carried out to diners in a separate dinning area by waiters/waitresses.

[0003] A close look at a typical dining experience with a full service restaurant reveals several instances where a diner may become frustrated with the service as a result of being in a position where the diner has to wait for a server to perform.

[0004] Other types of restaurants include primarily fast food and buffet-style restaurants.

[0005] Fast food is popular because it takes less time to prepare and it is relatively inexpensive. Buffets are becoming more and more popular nowadays because buffets allow diners to try many different dishes, rather than being limited to a single dish or predefined combinations when ordering from a menu.

[0006] However, foods provided by many of these conventional restaurants are generally believed to be unwholesome, usually too fatty, especially for some fast food restaurants. Fast food industry is currently under pressure from general public about the foods they are providing. There is an ever-increasing concern over the amount of oil or fat in one's diet. In particular, a low fat diet is desirable in light of related health concerns, such as obesity, overweight, diabetes, etc.

[0007] Another drawback associated with conventional restaurants is that diners have little, if not none, control over the ingredients in dishes they have ordered, because dishes are usually prepared by professional chefs in a remote kitchen based on predefined menus. Some diners are allergic to some specific additive ingredients.

[0008] On the contrary to conventional restaurants are restaurants that have decentralized cooking systems, in which dishes are prepared in multiple locations closer to dining areas, or by diners themselves.

[0009] There are many benefits associated with restaurants having decentralized cooking systems. First, diners waiting time could be significantly reduced; second, diners have more control over the ingredients in their dishes; third, each dish is individually cooked and customized to diners preference; and fourth, the operation cost of restaurants can be reduced.

[0010] However, there are some important hurdles, which have limited the level to which the cooking system of a restaurant can be decentralized.

[0011] First, cooking processes require considerable skills in judging the progress of a dish by the smell, look and feel of the food, and the sound of the cooking, especially for stir-frying, such as preparing Chinese foods, which is the brisk cooking of small cuts of meats and vegetables in hot oil over intense heat, calling for split-second timing and swift movements in an uninterrupted rhythm. Therefore, excessive decentralization may prohibitively increase the number of professional chefs required by a restaurant and

consequently the cost of restaurant operation.

[0012] Were there a way to capture and multiply the knowledge and the skills of a good chef, a whole new opportunity would be created for further expansion of restaurant industries and the level of decentralization of restaurant cooking systems can be further increased.

[0013] Second, the contact of moisture-containing raw foods with hot oil produces grease splattering. Most times, the splattering liquids and food particles reach out of cooking apparatuses to considerable distances. These will not only mess up surrounding surfaces but also create undue oil burn injuries to the people who are preparing foods.

[0014] Third, oil vapor is produced when oil is heated, causing long-term hazards to peoples health and to restaurant environment, as well.

[0015] Over years, various cooking apparatuses have been developed to address some of these problems. The latest development in automatic cooking apparatuses has been well documented in the following two US patent applications.

[0016] US Patent Application No. 10/604,389, filed by Zhaoxia Xu and Zheng Peng, on July 17, 2003, teaches an automatic frying apparatus for both deep and shallow frying.

The frying apparatus comprises a container for holding foods, a lid covering on top of the container, a bottom heating device installed underneath the container, a stirring blade rotatably and removably installed inside the container for stirring foods, a power-drive assembly operationally coupled with the stirring blade for driving the stirring blade through repeating stirring cycles, a blowing device for forcing fresh air into the frying apparatus for the removal of moisture inside the container, and a venting device for filtering and deodorizing cooking fumes.

[0017] US Patent Application No. 10/709,085, filed by Zhaoxia Xu and Zheng Peng, on April 12, 2004, teaches a stir-frying apparatus with a bottom heating device and an overhead-heating device. Based on extensive testing results, this stir-frying apparatus can fry foods much more efficiently than apparatuses having just a bottom-heating device and has reduced the cooking time required for a dish to 4 to 6 minutes.

[0018] Therefore, it remains desirable to provide a restaurant that has a decentralized cooking system, in which diners are provided with options to select and cook foods by themselves, such that diners waiting time is reduced, each dish is individually cooked and customized to diners pref-

erence, and the cost associated with restaurant operation is reduced.

Summary of Invention

[0019] Accordingly, the present invention is a restaurant method. The restaurant method includes steps of providing a dining area defined by a restaurant building, providing a plurality of dining tables disposed in the dining area, providing a plurality of seats disposed around each of these dining tables, and providing a plurality of cooking stations with each disposed on each of these dining tables, wherein each of these cooking stations includes a container having an open top for holding foods, a lid covering on top of the container for closing up the open top, a bottom heating device installed underneath the container for heating foods from below and an overhead heating device installed at an upper position of the cooking station for heating foods from above, a stirring blade rotatably and removably installed inside the container for stirring foods, a power-drive assembly operationally coupled with the stirring blade for driving the stirring blade through repeating stirring cycles, and a venting device for filtering and deodorizing cooking fumes; such that diners are provided with options to select and cook foods by themselves

and whereby each dish is individually cooked and customized to diners preference.

[0020] A restaurant comprising a dining area defined by a restaurant building, a plurality of dining tables disposed in the dining area, a plurality of seats disposed around each of the dining table, a plurality of stir-frying apparatuses with each disposed on each of the dining tables, wherein each of the stir-frying apparatuses includes a container having an open top for holding foods, a bottom heating device installed underneath the container for heating foods from below and an overhead heating device installed at an upper position of the stir-frying apparatus for heating foods from above, a stirring blade installed inside the container for stirring foods, a power-drive assembly operationally coupled with the stirring blade for driving the stirring blade through repeating stirring cycles, and a heating device for heating foods disposed inside said container, wherein diners are provided with options to select among raw foods and additive ingredients and to cook dishes by themselves, and whereby each dish is individually cooked and customized to diners preference.

[0021] Accordingly, the followings are some of the objects, fea-

tures, and advantages of the present invention.

[0022] It is an object of the present invention to provide a restaurant method for providing diners with individually cooked dishes that are more wholesome and tasteful.

[0023] It is another object of the present invention to provide a restaurant method that will reduce diners waiting time.

[0024] It is a further more object of the present invention to provide a restaurant method that will reduce restaurant operation costs.

[0025] It is a feature of the present invention that in the restaurant method each dining table is equipped with a cooking station, such that diners are provided with options to cook by themselves and whereby each dish is individually cooked and customized to diners preference.

[0026] It is another feature of the present invention that in the restaurant method raw foods and additive ingredients are pre-packed in bags that are adapted for individual dishes, such that the raw foods can be prepared in a remote factory.

[0027] It is an advantage of the present invention that this restaurant method saves diners time.

[0028] It is another advantage of the present invention that this restaurant method provides diners with healthy foods.

[0029] It is a further more advantage of the present invention that this restaurant method provides diners with the benefits of both fast food restaurants and sit-down full service restaurants.

[0030] It is a still more advantage of the present invention that this restaurant method is easy to franchise.

[0031] Further more features and advantages of the present invention will be readily appreciated, as the same becomes better understood after reading the subsequent description when considered in connection with the accompanying drawings.

Brief Description of Drawings

[0032] FIG. 1 illustrates a plan view of an embodiment of the present invention, restaurant*300*.

[0033] FIG. 2 illustrates a plan view of an individual table of dining tables *306* in FIG. 1.

[0034] FIG. 3 illustrates a plan view of another embodiment of the present invention, restaurant*350*.

[0035] FIG. 4 illustrates a cross-sectional view of a cooking station, stir-frying apparatus *100*.

[0036] FIG. 5 illustrates a cross-sectional view of stir-frying apparatus *100*, taken along line A-A of FIG. 4.

[0037] FIG. 6 illustrates a plan view of stir-frying apparatus *100*.

[0038] FIG. 7 illustrates a blocked diagram of control circuit *162* for stir-frying apparatus *100*.

[0039] FIG. 8 illustrates a schematic diagram of control circuit *50* for providing an intermittent operation of blade sweeping for stir-frying apparatus *100*.

Detailed Description

[0040] Reference is made to FIG. 1 and FIG. 2. FIG. 1 illustrates a plan view of an embodiment of the present invention, restaurant*300*, and FIG. 2 illustrated an exploded plan view of an individual dining table.

[0041] A dining area *302* is defined by a restaurant building *304*. A plurality of dining tables, generally designated as *306*, is provided in dining area *302*. A plurality of seats, generally designated as *308*, is provided and disposed around each dining table for seating diners *310*.

[0042] A plurality of cooking stations *312* is provided for dining tables *306*, with one cooking station for each dining table. Cooking stations *312* can be disposed on dining tables *306* or can be an integrated portion of dining tables *306*.

[0043] Each dining table is provided with various additive ingredients, designated as *314*. Some of ingredients *314* are pre-packed in bags that are adapted for individual dishes, while others might be stored in bottles or cups, such as

frying oil, soy sauce, etc.

[0044] Diners *310* are provided with raw foods *316*, which can be acquired from a bar *318* in dining area *302*. Raw foods *316* are either pre-packed in bags that are adapted for individual dishes or stored in utensils, like plates, bows, cups, etc.

[0045] Dining tables *306* are provided with recipe books, designated as *320*, such that diners *310* can cook various dishes based on the recipes in recipe books *320*. Recipe books *320* can be replaced with computers, disposed at appropriate locations on dining tables *306*, which are pre-loaded with recipes and related cooking information.

[0046] A kitchen (not shown) can be provided and adapted for various service needs, such as washing tableware and cooking utensils, providing diners with some customized food items, etc.

[0047] Reference is made to FIG. 3, which illustrated another embodiment of the present invention, restaurant *350*. Similar components are denoted with similar reference numbers for avoiding repetitive explanations. Reference is made to restaurant*3 00* of FIG. 1 for detailed information about these similar components.

[0048] A counter desk *352*, having a counter top, is provided in

dining area *302*, disposed at an appropriate location. A plurality of cooking stations *354* is provided and disposed on top of counter desk *352*. Diners *310* can cook their dishes using cooking stations *354* for dining in or for carrying out. Other features of restaurant *350* are similar to restaurant *300*.

[0049] The selection of cooking stations *312* and *354* is very important. Cooking stations *312* and *354* should meet some specific requirements, such that cooking stations *312* and *354* can be used for the purpose of the present invention. The requirements include, but not limited to, cooking fume free, splashing free, convenient to use, highly efficient in preparing foods, capable of being used for a wide range of applications, etc.

[0050] Reference is made to FIGS. 4-6, which illustrate an embodiment of a cooking station of cooking stations *312* and *354*,a stir-frying apparatus *100*.

[0051] Reference is made to FIG. 4, which illustrates a cross-sectional view of apparatus *100*.

[0052] Container *102*, having an open top and a central bottom aperture, is provided for holding foods. Container *102* is installed inside an outer container *104*, which is installed inside a housing *106*. The central bottom aperture is pro-

vided to allow a drive shaft *108* to thread therethrough. Container *102* is, preferably, coated with a non-stick material.

[0053] As shown in FIG. 5, which illustrates a cross-sectional view of apparatus *100*, taken along line A-A of FIG. 4, a lift handle *110* is installed on one side of container *102*, at an upper position. Handle *110* extends from container *102* to outside apparatus *100* through a recession on the upper edge of container *104* and a corresponding recession on the upper edge of housing *106*. A grasp handle *112* is installed on the other side of container *102*, at an upper position. Handle *112* extends from container *102* to outside apparatus *100* through corresponding recessions on the upper edges of container *104* and housing *106*. Handle *112* is lockably hinged, via hinge *112a*, at a position close to container *102*, such that handle *112* can be folded down or sideways to save some space when apparatus *100* is in a packed state.

[0054] A spacing element *114*, installed in between containers *102* and *104*, is provided for positioning and holding container *102* inside container *104*.

[0055] A housing support *11 6*, installed on the outside bottom of housing *106*, is provided for furnishing a bottom support

for apparatus *10 0*, such that apparatus *100* is adapted to stand on a flat surface, e.g., a kitchen counter top.

[0056] A bottom-heatingdevice *11 8*, installed on a bracket *118a* in between containers *102* and *104*, around the central bottom thereof, is provided for heating foods disposed inside container *102*from below. Heating device *11 8* is in a heat-transferable condition, e.g., in physical contact or radiation, with the bottom of container *102*, such that when heating device *11 8* heats up upon connection with an electricity source, foods therein will also heat up. Heating device *11 8* can be electrical resistance type heaters or many other types, such as high-intensity infrared lamps or magnetic heating devices, as known to those skilled in the art and suggested by this invention disclosure.

[0057] Reference is made to FIG. 4, again. A lid *1 20*, having an inner lid *1 20 a* and an outer lid *120b*, is provided for covering on top of container *102* for closing up the open top thereof. Lid *120 a* is installed on lid *1 20b*, which is hingedly installed on housing *106* via hinges *124*. A seal element *126*, installed on lid *120a*, is provided for sealing in between lid *120* and container *102*.

[0058] Anoverhead-heatingdevice *1 28*, installed on lid *120 a*, is provided for heating foods disposed inside container *102*

from above. Heating device *1 28* is preferably in a radiation heat-transferable condition with foods, such that when heating device *1 28* heats up upon connection with an electricity source, foods therein will also heat up. Heating device *1 28* can be electrical resistance type heaters or many other types, such as high-intensity infrared lamps, as known to those skilled in the art and suggested by this invention disclosure. A covering piece *130*, made of an infrared transparent material, is provided to protect heating device *128* against liquid splattering.

[0059] An observation window *132*, made of a transparent material, is installed on lid *120* for observing frying processes therethrough by users.

[0060] Also illustrated in FIG. 4 is a venting device *200*. Venting device *200*, installed on lid *120*, is provided for exhausting cooking fumes. Detailed discussion about venting device *200* shall be provided later on.

[0061] A coupling device *1 34* is provided for coupling drive shaft *108* and a stirring blade *136* for transferring rotation power. The lower portion of coupling device *13 4* generally forms a cylindrical configuration or any other suitable configurations and is engaged with blade *1 36*. A coupling element *1 38* on coupling device *134* is provided for lock-

ably receiving shaft *108*.

[0062] Blade *1 36*, rotatably and removably installed inside container *102* on the central bottom thereof, is provided for stirring foods. The design of blade *1 36* can be substantially different, as known to those skilled in the art. The front portion of blade *1 36* is close to the bottom of container *102* with a small-predetermined clearance for better scooping up food pieces. The rear portion of blade *136* extends gradually upward and serves for lifting up/ turning over food pieces. The clearance between the front portion of blade *136* and the bottom of container *102* is minimized for ideal performance.

[0063] The speed, at which blade *136* sweeps across food pieces, is important. For too low speeds, blade *136* cannot scoop up food pieces and therefore food pieces cannot be agitated adequately to achieve the desired effect of homogeneous heating. Co-rotation of food pieces with blade *136*, as blade *136* rotates, is another important issue needs to be solved. Therefore, a higher speed is desirable for better performance of scooping up food pieces. However, for continuous operation of blade sweeping, when the speed is high, food pieces are agitated too much, for too long time, such that the texture of food pieces could be dam-

aged.

[0064] To solve this dilemma, an intermittent operation of blade sweeping is proposed in this invention disclosure. In this intermittent operation, blade *136* dwells for a predetermined interval of time after one or two rounds of sweeping, referred to as one stirring cycle, and then automatically begins another cycle of operation. This intermittent operation affords relief from constant stirring of food pieces at a higher speed, prolongs the utility life of blade *136* and a power-drive assembly *140*, and saves some energy required for driving blade *136*, as compared with a continuous operation. This intermittent operation also favors foods of great texture because during the predetermined dwell period, the food pieces have adequate time to be heated; which, in turns, favors foods of great looking. A computer control method and an electronic control circuit for achieving this intermittent operation shall be disclosed later on, when the control portion of apparatus *100* is discussed.

[0065] Power-drive assembly *1 40* includes drive shaft *1 08* and a drive motor *1 42*.

[0066] Motor *1 42* is installed on the outside bottom of outer container *104*. The motor shaft of motor *142* threads

through a central aperture on the bottom of container *104* and is coupled with drive shaft *108* through a proper coupling mechanism.

[0067] Drive shaft *1 08* is operationally coupled with motor *1 42*, directly for a low-speed motor or via some gears or belt-pulley devices for a high-speed motor. The upper portion of drive shaft *1 08* is engaged with coupling device*1 3 4*via coupling element *138*. Drive shaft *108* is installed on container *104* via a bearing element *14 5*.

[0068] A seal device*144* is provided for sealing between shaft *108* and container *102*. Seal *144* comprises a seal flange *146*, a gland nut *148*, and a compression packing *150*.

[0069] Flange *146* is co-axial to shaft *108*. The first end of flange *146* is sealingly installed on the inside surface of the central bottom of container *102*. The second end of flange *146* emanates upwards to a predetermined height above the bottom of container *102*. Gland nut *148* is engaged with the second end of flange *146* by means of screw. Packing *150* creates a seal by being squeezed between the throat of the stuffing box formed by flange *146* and gland nut *148*. The squeeze force pushes the material of packing *150* against the throat of the box and rotating shaft *108*.

[0070] When leakage occurs, gland nut *148* is tightened further.

This is a typical application of compression packings for low speed rotating shafts, such as shaft *108*.

[0071] Materials are extremely important when selecting the proper packing for an application. Metallic packings are used in high-temperature applications. Shafts for copper and aluminum packings must be hardened to 500 Brinell hardness number (Bhn). Copper and aluminum packings can handle 538°C (1000°F) application temperature.

[0072] Seal *144* can, alternatively, take many other forms, such as bushing and labyrinth seals, or combinations of multiple forms for ideal performance, as known to those skilled in the art and suggested by this invention disclosure.

[0073] There is an important advantage of installing seal *144* inside container *102*. For most applications, seal *144* is disposed higher than hot liquids, such that the sealing surface is not immersed in hot liquids. Therefore, the requirement on seal *144* is significantly reduced. In addition, shaft *108* is much better supported at a higher position. In operation, the lower portion of coupling device *134* is routed over seal *144*.

[0074] As shown in FIG. 4, venting device *200* includes a venting conduit *206* and a venting filter *208*. The first end of venting conduit *206* is mounted on lid *120*. There is an opening

on lid *120* inline with venting conduit *206* for allowing cooking fumes to be forced out therethrough. Venting conduit *206* also serves as a bracket for holding venting filter *208*. Venting filter *208* is removably engaged with venting conduit *206*. Venting filter *208* further includes a disposable paper or fabric filter *208a* and/or a disposable activated charcoal filter *208b*, together, forming an integrated multi-stage filtering system.

[0075] Venting filter *208* is provided to trap the grease impurities in the grease-laden air forced out from inside apparatus *100*. Venting filter *208* is, preferably, made of one or multiple layers of metal meshes, such as aluminum ones. Metal meshes have different sizes of meshes and overlap each other. When cooking fumes pass therethrough, the oil particles will be trapped thereon. Filters *208a* and *208b* are provided to further remove the remaining oil vapor and chemical contents in cooking fumes and for the removal of cooking fume odors before the air is exhausted into the room.

[0076] Venting device *200* can be alternatively installed on apparatus *100* at many other proper positions. For example, venting device *200* can be alternatively installed on an upper portion of container *102*. These variations are, there-

fore, covered by this invention disclosure.

[0077] Reference is made to FIG. 5. An ingredient-adding conduit *250*, installed on lid *120*, is provided for use to add ingredients, such as salt, pepper, soy sauce, etc., during a frying process. A cap *252* is provided for closing up conduit *250* when conduit *250* is not in use.

[0078] Reference is made to FIG. 4, again. A control housing *1 52* is provided for housing electrical control devices or elements and supporting a control panel *154*. Control housing *1 52* is installed on the sidewall of housing *106*. Control panel *1 54* is provided for supporting elements, like switches, indicators, adjusting knobs, beepers, LCD, and so on.

[0079] FIG. 6 illustrates a plan view of apparatus *100*, indicating the layout of various components/devices of apparatus *100*.

[0080] FIG. 7 illustrates a block construction diagram of a control circuit *1 6 2* for controlling various functions of apparatus *100*, such as the temperature for frying foods and motor speeds for rotating blade *136*, etc. Circuit *1 6 2* comprises a microcomputer *1 6 4*, which controls various functions of apparatus *100*, a relay *1 6 5*, which activates heating device *12 8*,a relay *1 6 6*, which activates heating device*11 8*, and a

relay *168*, which activates motor *142*.

[0081] Microcomputer *164* is provided with ROM and RAM for data memory, and further provided with I/O ports A/D converters as interfaces. The aforementioned ROM's comprises a ROM *172* containing control programs related to the performance of frying processes and a ROM *174*, which memorizes referenced data.

[0082] A temperature sensor *176*, disposed at a proper position, is provided for measuring the temperature inside container *102*, which is taken by microcomputer *164*, as an input variable to be controlled. When the temperature is above the user's desired one, the electrical power to heating devices *118* and *128* will be shut down by relays *165* and *166* to better meet the user's desired frying requirement and to save energy.

[0083] Computer *164* can be such programmed that relay *168* activates motor *142* intermittently with a bias toward a longer dwell after each stirring cycle of one or two rounds of rotation.

[0084] Reference is made to FIG. 8, which illustrates a schematic diagram of a control circuit *50* for providing the intermittent operation of blade sweeping for apparatus *100*.

[0085] As shown in FIG. 8, drive motor *142* is operationally cou-

pled with blade *136* for providing rotation power. Motor *142* has a first terminal, which is connected to V-, the negative pole of a power source, and a second terminal, which is connected to the collector terminal of a PNP bipolar transistor *51*. The emitter terminal of transistor *51* is connected to V+, the positive pole of a power source. Associated with motor *1 42* is a linkage mechanism *52*, which cooperates with a single pole, double throw switch *53*, such that the shaft angle of motor *1 42* controls the switching position. Switch *53* includes a single pole *54*, which is connected to the first end of a capacitor *55*. Pole *54* may be switched alternately between two throw positions as represented by RUN and REST. The reference RUN refers generally to the position of blade *136* when in sweeping. On the other hand, the reference REST refers generally to the position of blade *136* when in dwelling. The RUN position represents substantially a large portion of a whole round of the rotation angle of the motor shaft, e.g., over 80%. The RUN position is associated with V- and the REST position is associated with V+.

[0086] A main switch *56* is provided for activating and deactivating the intermittent operation provided by circuit *50*. Switch *56* has a first terminal connected to V- and a sec-

ond terminal connected to the first end of a variable resistor *58*.

[0087] The second end of capacitor *55* is connected to the second end of resistor *58*. Also connected to the second end of capacitor *55* are the base of transistor *51* and the second end of a resistor *59*. The first end of resistor *59* is connected to the first terminal of a STIR switch *60*, which can activate a STIR feature, a manually activated continuous operation. The second terminal of switch *60* is associated with V–. The first end of resistor *59* is also connected to the second end of a capacitor *61*. The first end of capacitor *61* is connected to V–.

[0088] Switch *60* is a push button switch for activating the STIR feature. When switch *60* is pushed, the two terminals are connected, which causes the connection of the first end of resistor *59* to V– and, at the same time, causes capacitor *61* to be short-circuited.

[0089] With switch *56* in the activated position and switch *60* in the deactivated position, circuit *50* will operate blade *136* intermittently with a variable dwell period at the end of each sweeping cycle. This intermittent operation is achieved through the circuit of transistor *51*, switch *53*, capacitor *55*, and resistor *58*.

[0090] Now, to start with, suppose motor *1 42* has not been operating because switch *56* has been in the deactivated position. Also suppose switch *53* has been in the REST position, and thus capacitor *55* has been discharged.

[0091] When switch *56* is activated, the potential at the second end of resistor *58* will be lowered to cause transistor *51* to switch to conductive state, thereby energizing motor *1 42*. As soon as motor *1 42* begins to rotate, switch *53* will be thrown to the RUN position, which causes the first end of capacitor *55* to be connected to V-. Capacitor *55* will then begin to charge so as to make the second end of capacitor *55* positive with respect to the first end thereof. Sufficient base current will be provided through the base of transistor *51* to cause transistor *51* to remain conductive even after capacitor *55* becomes fully charged, thereby causing motor *1 42* to continue to rotate throughout a full rotation cycle until switch *53* is cycled back to the REST position. When switch *53* cycles back to the REST position, the first end of capacitor is then connected to V+ and capacitor *55* begins to discharge through resistor *58* until the potential at the second end of resistor *58* becomes sufficiently negative relative to V+. During this period of time, transistor *51* is switched to and remains in non-conductive state,

thereby stopping motor *1 42* for a predetermined interval of time. And then, sufficient base current flow resumes, causing transistor *51* to become conductive again, and a new cycle starts.

[0092] The length of the dwell interval is determined by the time required for capacitor *55* to discharge. Proper selection of capacitor *55* and resistor *58* will provide desirable dwell intervals.

[0093] With resistor *59* and capacitor *61* in addition, a manually activated continuous blade-sweeping feature can be achieved in addition to and in combination with the controllable variable dwell feature. This performance feature is achieved regardless of whether switch *56* is in the activated position or not when switch *60* is pushed. Moreover, it will be seen if switch *56* is in the activated position when switch *60* is pressed, there will be an immediate override of the intermittent operation. The continuous operation will keep on going without any dwell for a predetermined number of cycles, for example, one or two, after switch *60* is released, before the intermittent operation is resumed. If switch *56* is in the deactivated position when switch *60* is pressed, motor *1 42* will immediately start to rotate. After switch *60* is released, motor *1 42* will continue for a prede-

termined number of continuous sweeping cycles and then stops.

[0094] When switch *60* is pressed, the first end of resistor *59* is connected to V-. This allows sufficient current to flow through the base of transistor *51* to switch transistor *51* to conductive state, thereby causing motor *142* to start and operate. By proper selection of the value of resistor *59*, this mode of operation will occur regardless of the positions of switches *53* and *56*, so long as switch *60* is depressed.

[0095] At the same time, pressing switch *60* causes capacitor *61* to be short-circuited such that any charge stored therein is discharged through the short circuit to V-. When switch *60* is released, the current flowing out of the base of transistor *51* will continue through discharged capacitor *61* until capacitor *61* recharges. As a result, transistor *51* will continue in conductive state and motor *142* will continue to operate at the normal speed. Transistor *51* will continue in conductive state for a predetermined period of time based on the time constant provided by resistor *59* and capacitor *61*, which are preferably selected to provide one or two continuous sweeping cycles without any dwell after switch *60* is released.

[0096] One important point worth mentioning is that if power-drive assembly *1 4 0* has a rotation reduction mechanism, linkage *52* should be set between the output shaft of assembly *1 40* and switch *53*, instead of between motor *1 42* and switch *53*.

[0097] If multiple rounds of sweeping are desired for a stirring cycle, before one dwell period, e.g., two rounds of sweeping before one dwell period, a pair of gears, or some other mechanisms, should be provided, with the smaller one installed on the output shaft and the larger one cooperating with switch *53*. The transfer-ratio should be 1:2.

[0098] The intermittent operation of blade sweeping can be alternatively achieved using a mechanically controlled timer, e.g., a spring-driven timer (not shown). Numerous discrete contact poles can be provided on a circular plate, such that when a needle is rotating around a central shaft, the needle engages with each contact pole in sequence. The angle range of each pole represents a stirring cycle. At the end of each stirring cycle, there is a predetermined dwell period, which is represented by the angle range in between two adjacent poles.

[0099] In operation, a user is recommended to follow the following steps.

[0100] First, charges container *102* with some oil, and then pre-heats the oil to a predetermined temperature, preferably, halfway boiling. This step can be one step of a cooking program.

[0101] Second, charges container *102* with foods to be fried and some necessary ingredients.

[0102] Third, selects a temperature, a time duration, and a stirring blade rotation speed, or a program for frying foods, and then pushes on a start button to activate a frying process.

[0103] The whole frying process is hand-free. The user does not have to be involved with the frying process until the frying is accomplished or the frying apparatus beeps to remind the user to add more ingredients.

[0104] Therefore, a restaurant method includes the following steps: providing a dining area defined by a restaurant building; providing a plurality of dining tables disposed in the dining area; providing a plurality of seats disposed around each dining table; providing a plurality of cook stations, with each disposed on one of the dining tables; providing raw foods; providing additive ingredients; such that diners are provided with options to select among the raw foods and additive ingredients and to cook dishes by

themselves; and whereby each dish is individually cooked and customized to diners" preference.

[0105] Another restaurant method includes the following steps: Providing a dining area defined by a restaurant building; providing a plurality of dining tables disposed in the dining area; providing a plurality of seats disposed around each dining table; providing a counter having a counter top; providing a plurality of cook stations disposed on the counter top; providing raw foods; providing additive ingredients; such that diners are provided with options to select among the raw foods and additive ingredients and to cook dishes by themselves; and whereby each dish is individually cooked and customized to diners preference.

[0106] Accordingly, readers will see that this restaurant method of the present invention can provide diners with healthy and tasteful foods. Diners cook dishes by themselves, such that each dish is individually cooked and customized to diners preference. This restaurant method saves diners time and combines the benefits of fast food restaurants and full service restaurants. In additions, this restaurant method may reduce restaurant-operating costs.

[0107] The present invention has been described in an illustrative manner. It is to be understood that the terminology, which

has been used, is intended to be in the nature of words of description rather than of limitation.

[0108] Although this invention has been described in its preferred forms and structures with a certain degree of particularity, these should not be construed as limiting the scope of the invention but as merely providing illustrations of some of the presently preferred embodiments of this invention.

[0109] Thus it is understood that the present disclosure of the preferred forms can be changed in the details of construction and in the combination and arrangement of parts without departing from the spirit and the scope of the invention as hereinafter claimed.